REVIEW ARTICLE

Detecting the Deceptive Gossypiboma post-vaginal hysterectomy using Multimodality imaging - A Diagnostic Dilemma!

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ABSTRACT

Gossypiboma, or retained surgical sponge, is a rare post-surgical complication with very few reported cases due to medico legal purposes. Diagnosis is very challenging due to non-specific symptoms, myriad of clinical presentations and use of surgical sponges without radiological marker in most parts of our country. High index of suspicion in all patients with history of past surgery, use of multimodality imaging and thorough knowledge of radiological findings is of utmost importance to diagnose this condition. Infected collection can also be over diagnosed as gossypiboma by different imaging modalities. Therefore, possibility of infected collection as differential diagnosis should always be kept in mind, while diagnosing a gossypiboma.

We present the case of a 72 year old female with recent history of vaginal hysterectomy presenting with mild abdominal pain and distension. We describe the imaging findings in detail with the step wise use of ultrasound in raising suspicion, and CT and MRI to rule out other differentials to finally come to the probable diagnosis of gossypiboma or less likely infected collection and this was confirmed as infected collection by surgery.

INTRODUCTION

The term gossypiboma refers to a surgical sponge or a laparotomy pad left involuntarily in the body after a surgical procedure and is derived from Latin word "Gossypium" meaning cotton and Swahili word "boma" meaning place of concealment[1, 2].

This rare surgical complication was first reported by Wilson in 1884[3], and since then it has been reported in 1 in 100 - 5,000 surgical interventions and 1 in 1,000 - 1,500 intra-abdominal operations[4].

Gossypiboma poses a great diagnostic dilemma due to non-specific symptoms, associated complications and thus many cases may be misdiagnosed as a tumor[5] or abscess[6] in the abdomen and pelvis[7].

Most gossypiboma cases are discovered during the first few days after surgery; however, they may remain undetected for many years[1, 8]. Imaging modalities including plain radiography, ultrasonography (USG) though affordable and easily available may not be sufficient and computed tomography (CT), and magnetic resonance imaging (MRI) may be needed[1,7,9]. Early and accurate diagnosis of gossypiboma plays a very important role for delivering proper treatment and reducing physical and psychological morbidity and mortality[7]. High index of suspicion and thorough knowledge of imaging appearances are needed to make this possible.

CASE REPORT

A 72 year old lady with history of transvaginal hysterectomy 7 days back presented with progressively increasing lower abdominal pain and abdominal distension. There was no history of significant transvaginal discharge or fever. On clinical examination the lower abdomen was tense and tender with presence of mild guarding. She was referred to the radiodiagnosis department to rule out any post op collection or hematoma.

On ultrasound examination an irregular shaped heterogeneous hypoechoic lesion, measuring 6 x 5 cm, with string posterior acoustic shadowing, was noted lying posterior to the urinary bladder and anterior to the rectum, in close proximity to the vaginal stump. Multiple internal echogenic foci with dirty distal acoustic shadowing, likely air foci were noted in the lesion (Figure 1). No internal vascularity was noted on colour doppler examination (Figure 2). The caudal aspect of the lesion was obscured by the shadow of pubic bone and CT scan was performed for better delineation.

On CT scan, lesion appeared localized, heterogenous with soft tissue density and ill-defined margins. Presence of central air foci was confirmed and few specks of hyper densities (Mean-88 HU) were identified in the lesion, likely blood products (Figure 3). Significant surrounding inflammatory changes showing significant contrast

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enhancement were noted on contrast enhanced images with perirectal and perivesical fat stranding, oedematous wall thickening of adjacent walls of urinary bladder, rectum and small bowel loops (Figure 4). No evidence of any fistulous communication, calcification and metallic density noted. A differential diagnosis of infected post-op hematoma v/s retained gauze piece with surrounding foreign body reaction was made. To rule out the presence of anaerobic bacterial abscess, MRI examination was done.

MRI showed presence of central T1 isointense (Figure 5), T2/STIR hypointense area (Figure 6) with significant blooming on GRE images (Figure 7) suggestive of early sub acute blood products. Surrounding heterogeneous STIR hyper intensity was noted (Figure 8); however, no diffusion restriction was noted on DWI/ADC, ruling out the presence of anaerobic bacterial abscess. Differential diagnosis was gossypiboma or less likely infected collection; patient was operated transabdominally and the findings were confirmed as infected collection by surgery.

Figure 1: Sagittal transabdominal ultrasound image showing an irregular heterogenous hypoechoic lesion (straight arrow) with ill-defined echogenic margins and multiple internal air foci (curved arrow) with dirty distal acoustic shadowing was noted in the pelvis, posterior to urinary bladder, and anterior to rectum (arrowhead). Star- urinary bladder with foley's in situ.

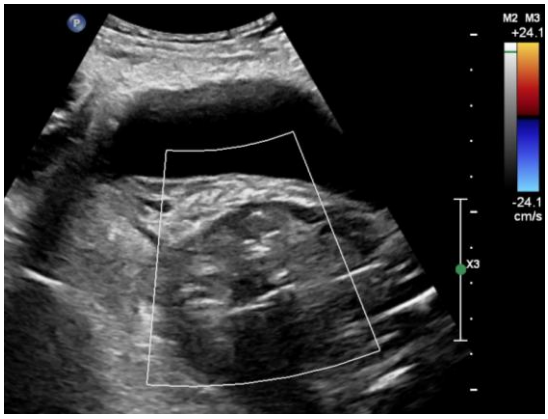

Figure 2: Transverse transabdominal colour doppler image showing no vascularity inside the lesion.

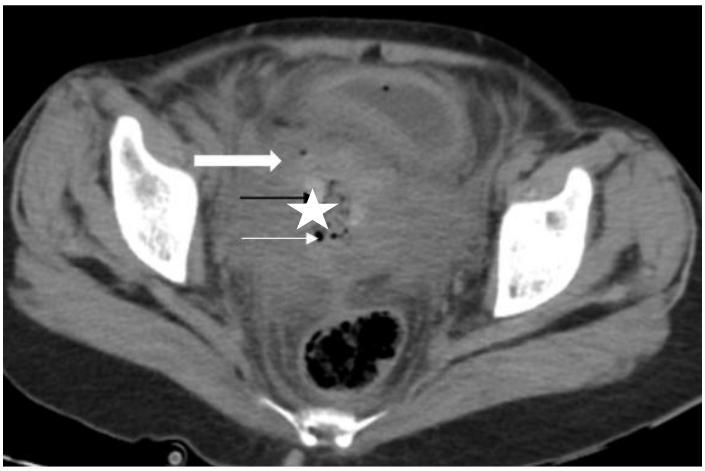

Figure 3: Axial NCCT pelvis image showing localized, heterogenous lesion with soft tissue density (thick white arrow), central air foci (white thin arrow) and few specks of hyperdensities (black arrow) (Mean-88 HU), likely blood products.

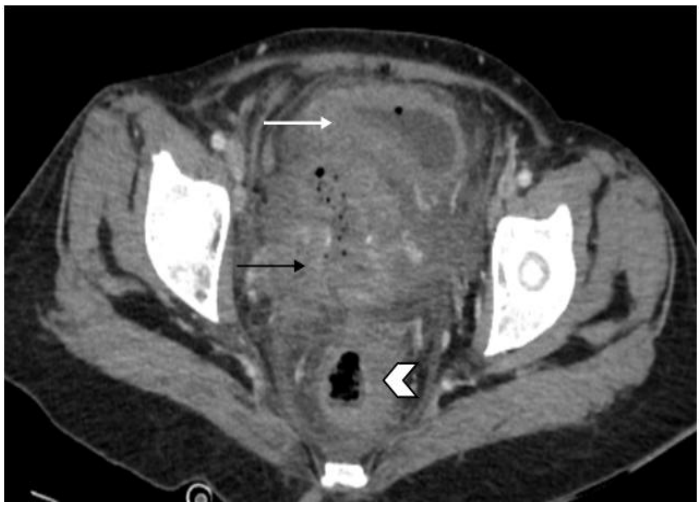

Figure 4: Axial CECT image showing significant perilesional enhancement (black arrow) with thick enhancing posterior urinary bladder wall (white arrow) and anterolateral rectal wall (white arrowhead).

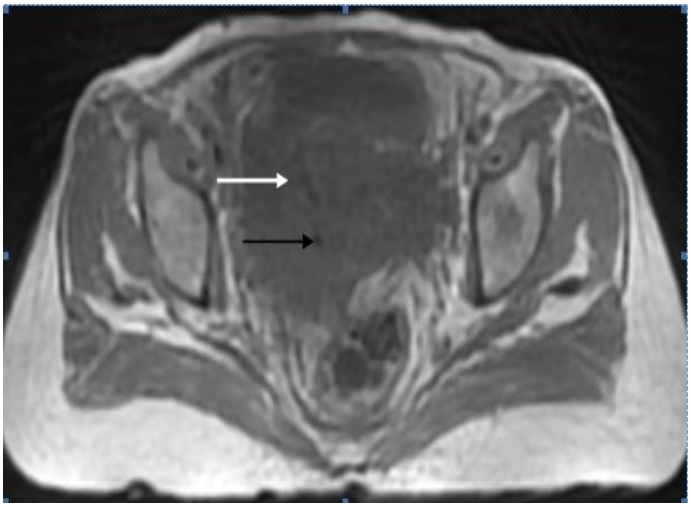

Figure 5: T1 W axial MRI image showing isointense lesion in pelvis with multiple internal hypointense foci.

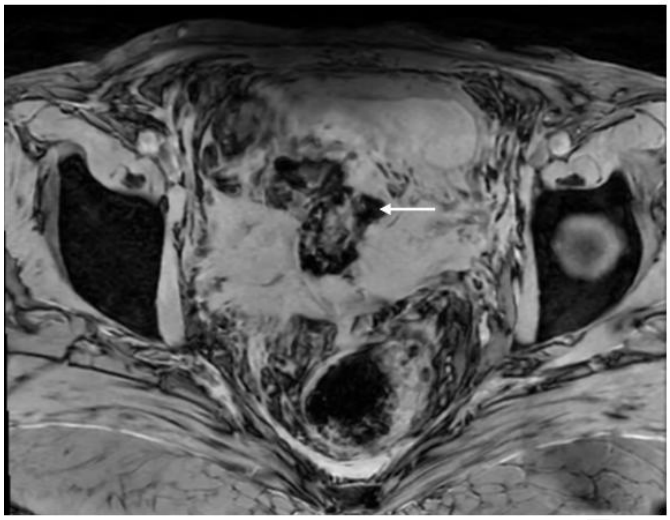

Figure 6: Multiple localized patchy areas of blooming (white arrow) are noted in the lesion on GRE, suggestive of blood products.

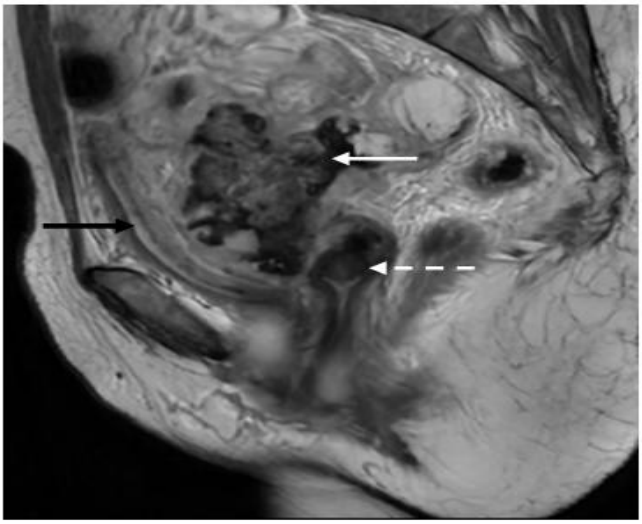

Figure 7: Sagittal T2W MRI image showing T2 hypo-intensity in the lesion (white solid arrow) lying antero-superior to the vaginal stump (white dashed arrow), and posterior to the bladder (black arrow).

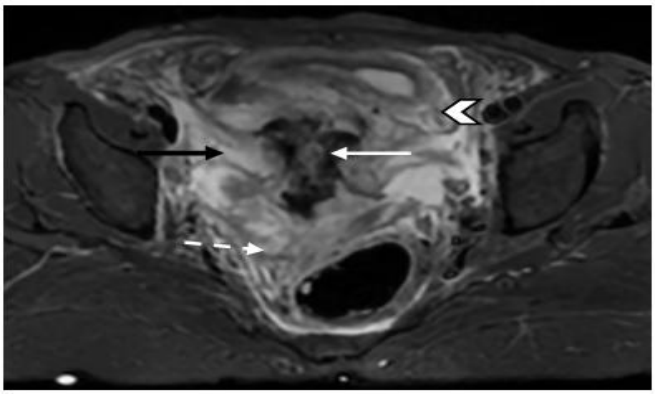

Figure 8: Ill-defined STIR hyper intensity (black arrow) (likely inflammatory tissue) noted surrounding the central heterogeneous hypo intensity (white arrow). Also note the increased attenuation of the perirectal (dashed white arrow), perivesical fat and posterior wall of urinary bladder (arrowhead) and anterior wall of rectum.

DISCUSSION

Retained postoperative foreign body is a rare condition, of which surgical sponges are the most common, and is commonly known as gossypiboma or textiloma[10]. Abdominal or pelvic cavity is the most frequent location with most cases occurring after gynaecological and upper abdominal surgical procedures[10]. Only a few case reports are available till date, describing their imaging characteristics.

Risk factors for development include emergency surgery, unexpected change in the surgical procedure, hurried sponge counts, long operations, unstable patient, obesity etc[1]. According to the study by Gawande et al[11], retained sponges are 9 times more likely after an emergency operation and 4 times more likely when an unexpected change in the surgical procedure is undertaken[10].

The retained surgical sponge can trigger two types of biological responses: aseptic fibrinous response leading to foreign body granuloma formation or exudative reaction causing abscess formation[1, 12].

Gossypibomas may present at any time, from a few weeks to several decades after initial surgery. The symptoms depend upon the location, size of swab, the type of reaction that occurs, time since retention and any associated complications, thus leading to wide variety of presentations[4]. They may present early with pain with or without lump formation or with non-specific symptoms like- nausea, vomiting, abdominal distension, rectal bleeding, altered bowel habit, fever, anorexia, weight loss, mal-absorption syndrome, or a palpable mass[4, 13]. Others may remain asymptomatic for a long time with only vague symptoms[1].

In chronic cases with intense foreign body reaction, dense adhesions can form around the gossypiboma, and patient may present with complications like sub acute intestinal obstruction[1]. Other complications include- abscess formation, peritonitis, fistula formation, non-healing infection of the surgical wound etc[4]. The longer the retention time, the higher is the risk of fistulisation and other complications which highlights the importance of early diagnosis[4, 14].

Plain radiography is usually the first investigation done due to wide availability and can help detect gossypiboma containing a radio-opaque marker[10]. Radio-opaque threads impregnated into surgical gauzes were first introduced by Cahn in 1929[4, 15]. The markers may be distorted by folding, twisting or disintegration over time[4]. They are still not used in many parts of our country, and this warrants the use of further imaging to come to a diagnosis[4].

On ultrasonography, gossypibomas may present as - (i) an echogenic area with intense posterior shadow; (ii) in cases of exudative reactions they are seen as a well-defined cystic mass containing distinct internal hyperechoic wavy, striped focus and (iii) non-specific pattern with a hypoechoic mass[4, 14]. Acoustic shadowing is

observed in most of the cases likely due to the attenuation of beam by foreign body as well as presence of gas and sometimes calcification[4, 16].

CT and MRI have superior advantages to ultrasonography in differentiating from tumour, hematoma, or abscess. CT is very useful for identifying radio-opaque marker or gas bubbles present inside the lesion. Calcified reticulate rind sign may be identified in chronic cases, which may be formed by gradual deposition of calcification along the fibre network of the surgical gauze[7, 17]. The characteristic CT feature is a low-density heterogeneous whorl-like spongiform hypo dense mass containing air bubbles with an external high-density wall showing contrast enhancement[3, 4].

On MRI, gossypiboma appears as a well-defined mass, showing hypo intensity on T1WI and T2WI[7,18]. In differentiation of tumor from gossypiboma, DWI plays an important role with lack of diffusion restriction in the gossypiboma[19]. As concluded in previous studies, combining patient history and symptoms with imaging features are important to make the accurate diagnosis[10].

Gossipiboma is usually asymptomatic and have nonspecific radiological findings. Therefore, gossipiboma should be included in differential diagnosis of soft tissue masses or localised abdominal pain in patients with history of operation[1].

Treatment protocol is removal of the retained sponge surgically, endoscopically or laparoscopically to prevent severe complications[10].

CONCLUSION

Gossypiboma is a rare postoperative complication which often goes undetected for long duration due to nonspecific symptoms and a myriad of imaging appearances resulting in significant patient morbidity and mortality. It can be avoided by vigilant post-op sponge counts and use of textile materials impregnated with a radio-opaque marker. Gossypiboma without a radiological marker poses a great challenge for diagnosis on radiological imaging as it can simulate a hematoma, granulomatous process, abscess formation, cystic masses, or neoplasm. High index of suspicion in all patients with history of past surgery, use of multimodality imaging and thorough knowledge of radiological findings is of utmost importance to diagnose this condition. Infected collection can also be over diagnosed as gossypiboma by different imaging modalities. Therefore, possibility of infected collection as differential diagnosis should always be kept in mind, while diagnosing a gossypiboma.

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